[0102] Here, a distribution curve of frequencies is flatter when the prediction accuracy of a predictive vector MVPs is low, while the distribution curve of frequencies is steeper when the prediction accuracy of MVPs is high. FIG. 2 is a diagram describing a method for obtaining a predictive vector MVPs. FIG. 2 (a) and FIG. 2 (b) are diagrams showing, on a macroblock basis, information regarding shape signal components and luminance signal components, respectively. The former shows that there are a current macroblock MB to be coded and, as its adjacent macroblocks, macroblocks having shape motion vectors MVs1, MVs2 and MVs3. The latter shows that there are a current macroblock MB to be coded and, as its adjacent macroblocks, macroblocks having texture motion vectors MV1, MV2 and MV3.

[0103] In order to code the macroblock MB in this case, in the system of the present invention, the coding process of the current macroblock starts with checking whether or not the macroblocks adjacent to the current macroblock have the shape motion vectors MVs1, MVs2 and MVs3 respectively in this order so that the shape motion vector which has been estimated first is determined to be MVPs.

[0104] In the case where there is no shape motion vector MVs1, MVs2 or MVs3, it is checked in turn whether or not the macroblocks adjacent to the current macroblock have the texture motion vectors MV1, MV2 and M⑤3 respectively in this order so that the motion vector which has been estimated first is determined to be a predictive motion vector MVPs.

[0105] In the case where there is no texture motion vector MV1, MV2 or MV3, a predictive vector MVPs is determined to be a zero vector.

[0106] The system of the present invention allows the motion vector prediction unit 505 to have the above-described functions.

[0107] Note that as described in the above-mentioned reference document, there are both cases where the texture motion vectors (MV1, MV2 and MV3) are available and where they are not available. The latter case is, for example, a mode in which texture information is not coded but only shape information is coded, or the case where there is no texture motion vector MV1, MV2 or MV3 for a current macroblock to

be coded. In other words, assuming that a texture motion vector is reliable, it can be said that, in this approach, the prediction accuracy of a predictive vector MVps is higher if a texture motion vector is available, compared with the case where it is not available.

[0108] (First Specific Example 1) Now, in the present embodiment, as shown in FIG. 3, plural phases of search ranges are prepared and, in the case where a texture motion vector is available, the search range is switched depending on the prediction accuracy of a predictive vector MVPs. For example, plural phases of search ranges, such as a "search range 1", a "search range 2", and a "search range 3", are prepared, and the range sizes of these search ranges 1, 2 and 3 are 4×4 pixels, 8×8 pixels and 16×16 pixels, respectively.

[0109] By improving the architecture shown in FIG. 11 by adding, as a function of the shape motion vector estimation unit 502, a function to detect the prediction accuracy of a predictive vector MVPs and to switch a motion vector search range depending on this prediction accuracy, as described above, it is possible to reduce an amount of calculation required for motion vector estimation without decreasing coding efficiency. The prediction accuracy can, for example, be determined based on an amount of difference from the predictive motion vector MVPs obtained by the motion vector prediction unit 505.

[0110] As a specific example of a motion vector search range, the "search range 1" which is the smallest range is used if a texture motion vector is reliable, the "search range 2" which is somewhat larger than the search range 1 is used if the texture motion vector is not reliable, and the "search range 3 which is the largest range is used if no texture motion vector is available.

[0111] To be more specific, when estimating a motion vector based on an alpha-map signal (shape information A) inputted via a coded area detection unit (Bounding-rectangle) that detects a coded area which is an area where a target object in a frame image is present, predictive vector information obtained by the motion vector prediction unit 505, and a shape information signal in the frame memory 506, the shape motion vector estimation unit 502 is operated to calculate the prediction accuracy of a predictive vector MVPs and estimate a shape motion vector within the optimum motion vector search range switched

depending on the prediction accuracy. Then, the shape motion vector estimation unit 502 is operated to output the estimated vector as shape motion vector information.

[0112] By doing so, in coding a macroblock, if the reliability of a shape motion vector is high as a result of checking the reliability thereof based on the prediction accuracy of the texture motion vector, it is possible to perform a calculation required for motion vector estimation using a narrow search range around a current macroblock to be coded, and therefore possible to reduce an amount of calculation required for motion vector estimation. If a texture motion vector is not reliable or no texture motion vector is available, it is possible to estimate a motion vector by expanding the search range.